E-Letter responses to:

letters:
Pavel M. Borodin;, Steven Henikoff, Kami Ahmad, and Harmit S. Malik
Speciation and Centromere Evolution
Science 2001; 294: 2478-2480 [Full text]

PUBLISHED E-LETTER RESPONSES:

Repetitive DNA Elements and Evolution
Cesar Martins (21 December 2001)

Repetitive DNA Elements and Evolution 21 December 2001

Cesar Martins,
Associate Professor
Depto. Morfologia, Instituto de Biociências, Universidade Estadual Paulista, SP, Brazil

Respond to this E-Letter:
Re: Repetitive DNA Elements and Evolution

In the article "Speciation and Centromere Evolution," P.M. Borodin suggests that "satellite DNA divergences take place after the speciation event and is a consequence rather than a cause of speciation". The role of repetitive DNA elements has been pointed out to be of great importance for genome evolution (1). These sequences represent a large portion of the genome and play a role in the chromosome structure, segregation, and evolution, nuclear architecture, species evolution, and repression/activation of gene transcription.

Repetitive sequences are under the action of several molecular mechanisms such as gene conversion, unequal crossing-over, transposition, slippage-replication, and RNA-mediated exchanges that cause non-Mendelian segregation ratios leading to a particular pattern of evolution (2). Such mechanisms can result in mutations that can confer fitness losses or gains (3), thus having a significant impact on the speciation process.

Although the nature of the forces controlling the repetitive DNA elements is poorly known, their abundance and intense evolutionary dynamics strongly suggest an important role as one of the causes of speciation process rather than only a consequence of speciation.

References and Notes

1. B. Charlesworth, P. Snlegowski, W. Stephan, Nature 371, 215 (1994).

2. G. A. Dover, Trends Genet. 2, 159 (1986).

3. P. Parniewski, A. Jaworski, R. D. Wells, R. P. Bowater, J. Mol. Biol. 299, 865 (2000).